Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Previously Presented) A method for detecting the presence of a single target nucleic acid molecule in a sample, said method comprising:

providing a sample containing at least one target nucleic acid molecule to be amplified and constituents for enabling amplification of the target nucleic acid molecule;

loading the sample into a sample chamber, said sample chamber including a device for retaining a reaction product of amplification of a single target nucleic acid molecule of said sample such that a reaction product of the amplification of the single target nucleic acid molecule attains a detectable concentration within at least a portion of said sample chamber after a single round of amplification when subjected to a homogeneous amplification assay;

subjecting the sample in said sample chamber to a homogeneous amplification assay including a single round of amplification under conditions such that amplification of said at least one target nucleic acid molecule occurs and the reaction product of the amplification of a single target nucleic acid molecule of said sample attains a detectable concentration within said at least a portion of said sample chamber after said single round of amplification; and

detecting the reaction product of said single target nucleic acid molecule after said single round of amplification.

2. (Previously Presented) A method for detecting the presence of a single target nucleic acid molecule in a sample, said method comprising:

providing a sample containing at least one target nucleic acid molecule to be amplified and constituents for enabling amplification of the target nucleic acid molecule;

loading the sample into a sample chamber, said sample chamber including means for retaining a reaction product of amplification of a single target nucleic acid molecule of said sample such that a reaction product of the amplification of the single target nucleic acid molecule attains a detectable concentration within at least a portion of said sample chamber after a single round of amplification when subjected to a homogeneous amplification assay;

subjecting the sample to a homogeneous amplification assay including a single round of amplification under conditions such that amplification of said at least one target nucleic acid molecule occurs and the reaction product of the amplification of a single target nucleic acid molecule of said sample attains a detectable concentration within said at least a portion of said sample chamber after said single round of amplification; and

detecting the reaction product of said single target nucleic acid molecule after said single round of amplification.

3. (Previously Presented) A method for detecting the presence of a single target nucleic acid molecule in a sample, said method comprising:

loading a sample into a sample chamber, said sample comprising constituents for enabling amplification of a target nucleic acid molecule, said sample chamber including a device for retaining a reaction product of amplification of a single target nucleic acid molecule of said sample such that a reaction product of the amplification of the single target nucleic acid molecule attains a detectable concentration within at least a portion of said

sample chamber after a single round of amplification when subjected to a homogeneous amplification assay;

subjecting the sample in said sample chamber to a homogeneous amplification assay including a single round of amplification under conditions such that amplification of said at least one target nucleic acid molecule occurs and the reaction product of the amplification of a single target nucleic acid molecule of said sample attains a detectable concentration within said at least a portion of said sample chamber after said single round of amplification; and

detecting the reaction product of said single target nucleic acid molecule after said single round of amplification.

4. (Previously Presented) A method for detecting the presence of a single target nucleic acid molecule in a sample, said method comprising:

loading a sample into a sample chamber, said sample comprising constituents for enabling amplification of a target nucleic acid molecule, said sample chamber including means for retaining a reaction product of amplification of a single target nucleic acid molecule of said sample such that a reaction product of the amplification of the single target nucleic acid molecule attains a detectable concentration within at least a portion of said sample chamber after a single round of amplification when subjected to a homogeneous amplification assay;

subjecting the sample to a homogeneous amplification assay including a single round of amplification under conditions such that amplification of said at least one target nucleic acid molecule occurs and the reaction product of the amplification of a single target nucleic acid molecule of said sample attains a detectable concentration within said at least a portion of said sample chamber after said single round of amplification; and

detecting the reaction product of said single target nucleic acid molecule after said single round of amplification.

5. (Previously Presented) A method as recited in claim 1, wherein said reaction product of said amplification of said single target nucleic acid molecule of said sample attains a detectable concentration within said portion of said sample chamber after said single round of amplification.

6. (Previously Presented) A method as recited in claim 2, wherein said reaction product of said amplification of said single target nucleic acid molecule of said sample attains a detectable concentration within said portion of said sample chamber after said single round of amplification.

7. (Previously Presented) A method as recited in claim 3, wherein said reaction product of said amplification of said single target nucleic acid molecule of said sample attains a detectable concentration within said portion of said sample chamber after said single round of amplification.

8. (Previously Presented) A method as recited in claim 4, wherein said reaction product of said amplification of said single target nucleic acid molecule of said sample attains a detectable concentration within said portion of said sample chamber after said single round of amplification.

9. (New) A method for detecting whether at least one molecule of a target nucleic acid is present in a first sample portion, said method comprising:

loading a first sample portion into a first sample chamber, said first sample portion comprising at least part of a sample, whereby if said first sample portion contains at least a single molecule of said target nucleic acid, said first sample portion would attain a detectable concentration of said target nucleic acid within a portion of said first sample chamber after a single round of amplification,

subjecting said first sample portion in said first sample chamber to at least a first amplification step; and then

determining whether said first sample portion contains at least one molecule of said target nucleic acid.

10. (New) A method as recited in claim 9, wherein said first amplification step is a thermocycle step.

11. (New) A method as recited in claim 9, wherein said first amplification step is a homogeneous amplification step.

12. (New) A method as recited in claim 9, wherein said first sample chamber further comprises constituents for enabling amplification of a target nucleic acid.

13. (New) A method as recited in claim 9, wherein if said first sample portion contains at least a single molecule of said target nucleic acid, said first sample portion would

attain a detectable concentration of said target nucleic acid within a portion of said first sample chamber after a single amplification step.

14. (New) A method as recited in claim 9, wherein said first sample chamber has a volume of about 1 picoliter or less.

15. (New) A method as recited in claim 9, wherein said first sample chamber has a volume in the range of from about 1 picoliter to about 1 microliter.

16. (New) A method as recited in claim 9, wherein said first sample chamber has a volume of about 10 picoliters or less.

17. (New) A method as recited in claim 9, wherein said first sample chamber has a volume of about 100 picoliters.

18. (New) A method as recited in claim 9, wherein said first sample chamber has a volume of about 1 nanoliter.

19. (New) A method as recited in claim 9, wherein said first sample chamber has a volume of 10 nanoliters or less.

20. (New) A method as recited in claim 9, wherein said first sample chamber has a volume of about 10 nanoliters.

21. (New) A method as recited in claim 9 wherein said first sample chamber is positioned in a device which comprises from about 10,000 to over 100,000 sample chambers.

22. (New) A method as recited in claim 9, wherein said first sample portion has a volume of about 1 picoliter or less.

23. (New) A method as recited in claim 9, wherein said first sample portion has a volume in the range of from about 1 picoliter to about 1 microliter.

24. (New) A method as recited in claim 9, wherein said first sample portion has a volume of about 10 picoliters or less.

25. (New) A method as recited in claim 9, wherein said first sample portion has a volume which is nanoliter-sized.

26. (New) A method as recited in claim 9, wherein said first sample portion has a volume of about 1 nanoliter or less.

27. (New) A method as recited in claim 9, wherein said first sample portion has a volume of about 10 nanoliters or less.

28. (New) A method as recited in claim 9, wherein said first sample portion has a volume of about 100 nanoliters or less.

29. (New) A method as recited in claim 9, wherein said first sample portion has a volume of about 1 microliter or less.

30. (New) A method as recited in claim 9, wherein said first sample chamber contains at least one amplification targeting reagent.

31. (New) A method as recited in claim 9, wherein said method further comprises positioning a first amplification targeting reagent in said first sample chamber.

32. (New) A method as recited in claim 31, wherein said first amplification targeting reagent is positioned in said first sample chamber prior to said loading a first sample portion.

33. (New) A method as recited in claim 31, wherein said first amplification targeting reagent is positioned in said first sample chamber while said first sample portion is being loaded into said first sample chamber.

34. (New) A method as recited in claim 31, wherein said first amplification targeting reagent is positioned in said first sample chamber after said loading a first sample portion.

35. (New) A method as recited in claim 9, wherein:

said first sample chamber is positioned in a microfludic device which comprises at least one flow-through channel which communicates with said first sample chamber, and

said method further comprises supplying at least one displacing fluid to said flow-through channel after loading a portion of said first sample into said flow-through channel, whereby said displacing fluid displaces said first sample from said flow-through channel.

36. (New) A method as recited in claim 9, wherein:

said first sample chamber is positioned in a microfludic device which comprises at least one flow-through channel which communicates with said first sample chamber, and

said method further comprises supplying at least one sealing fluid to said flow-through channel after loading a first sample portion into said first sample chamber, whereby said sealing fluid seals said first sample portion within said first sample chamber.

37. (New) A method as recited in claim 36, wherein said method further comprises curing said sealing fluid after said supplying said sealing fluid to said flow-through channel.

38. (New) A method as recited in claim 36, wherein said sealing fluid comprises at least one adhesive.

39. (New) A method as recited in claim 36, wherein said sealing fluid is immiscible with said first sample portion.

40. (New) A method as recited in claim 39, wherein said sealing fluid displaces a second portion of said sample from said flow-through channel.

41. (New) A method as recited in claim 36, wherein said sealing fluid displaces part of said first sample portion from said flow-through channel as said sealing fluid enters said flow-through channel.

42. (New) A method as recited in claim 9, wherein said method further comprises sealing said first sample portion within said first sample chamber by positioning and curing at least one cured adhesive.

43. (New) A method as recited in claim 9, wherein said method further comprises positioning a sealing device adjacent to said first sample chamber.

44. (New) A method as recited in claim 43, wherein said sealing device is selected from the group consisting of microscope slide coverslips, tapes, films, silicon films, silicon devices, and devices comprising an array of reactants.

45. (New) A method as recited in claim 9, wherein said first sample chamber is positioned in a microfluidic device which comprises a plurality of sample chambers.

46. (New) A method as recited in claim 45, wherein each of said sample chambers has a volume of about 1 picoliter or less.

47. (New) A method as recited in claim 45, wherein each of said sample chambers has a volume in the range of from about 1 picoliter to about 1 microliter.

48. (New) A method as recited in claim 45, wherein each of said sample chambers has a volume of about 10 picoliters or less.

49. (New) A method as recited in claim 45, wherein each of said sample chambers has a volume of about 100 picoliters.

50. (New) A method as recited in claim 45, wherein each of said sample chambers has a volume of about 1 nanoliter.

51. (New) A method as recited in claim 45, wherein each of said sample chambers has a volume of 10 nanoliters or less.

52. (New) A method as recited in claim 45, wherein each of said sample chambers has a volume of about 10 nanoliters.

53. (New) A method as recited in claim 45, wherein each of said sample chambers contains at least one amplification targeting reagent.

54. (New) A method as recited in claim 9, wherein said sample chamber has at least one dimension of 500 microns or less.

55. (New) A method as recited in claim 54, wherein said sample chamber has at least one dimension of 100 microns or less.

56. (New) A method as recited in claim 9, wherein said sample chamber has opposing barriers separated by 500 microns or less.

57. (New) A method as recited in claim 56, wherein said sample chamber has opposing barriers separated by 100 microns or less.

58. (New) A method as recited in claim 56, wherein at least said first sample chamber contains at least a first amplification targeting reagent, and at least a second sample chamber contains at least a second amplification targeting reagent, said first amplification targeting reagent differing from said second amplification targeting reagent.

59. (New) A method as recited in claim 58, wherein said first amplification targeting reagent is positioned in said first sample chamber prior to said loading said first sample portion.

60. (New) A method as recited in claim 58, wherein said first amplification targeting reagent is positioned in said first sample chamber while said first sample portion is being loaded into said first sample chamber.

61. (New) A method as recited in claim 58, wherein said first amplification targeting reagent is positioned in said first sample chamber after said loading a first sample portion.

62. (New) A method as recited in claim 9, wherein said determining whether said first sample portion contains at least one molecule of said target nucleic acid is performed by

carrying out a procedure which generates signals having magnitude which is higher where said detectable concentration is present than where said detectable concentration is not present.

63. (New) A method as recited in claim 62, wherein said procedure comprises detecting fluorescence from fluor-labeled materials.

64. (New) A method as recited in claim 62, wherein said procedure comprises detecting at least one chemical property which changes upon hybridization.

65. (New) A method as recited in claim 62, wherein said procedure comprises evaluating at least one property selected from among the group consisting of agglutination, turbidity, phosphorescence, light scattering, light absorbance, fluorescence energy transfer, fluorescence quenching, fluorescence dequenching, time-delayed fluorescence, chemiluminescence and calorimetric evaluation.

66. (New) A method as recited in claim 9, wherein said sample chamber comprises a microcapillary device, and wherein said peaks are generated by detecting regions within said microcapillary device in which said detectable concentration is present.

67. (New) A method as recited in claim 9, wherein said first sample chamber comprises a first microcapillary device.

68. (New) A method as recited in claim 67, wherein said first sample chamber is positioned in a microfluidic device which comprises a plurality of microcapillary devices.

69. (New) A method as recited in claim 9, wherein said target nucleic acid comprises at least one nucleic acid sequence of at least one pathogenic organism.

70. (New) A method as recited in claim 9, wherein said first sample portion comprises at least one forensic sample.

71. (New) A method as recited in claim 9, wherein said target nucleic acid is indicative of the likelihood or presence of at least one genetic disorder.

72. (New) A method as recited in claim 9, wherein said method for detecting whether at least one molecule of said target nucleic acid is present in said first sample portion is part of a procedure selected from among the group consisting of analyzing mutations in activated oncogenes, molecular cloning, analyzing DNA, and detecting at least one sequence difference.

73. (New) A method as recited in claim 72, wherein said procedure comprises at least one task selected from among the group consisting of generating specific sequences of DNA for cloning or use as probes, detecting segments of DNA for genetic mapping, detecting expressed sequences by amplification of particular segments of cDNA, analyzing expressed sequences by amplification of particular segments of cDNA, generating libraries of cDNA

from small amounts of mRNA, generating large amounts of DNA for sequencing, analyzing mutations, and chromosome crawling.

74. (New) A method as recited in claim 72, wherein said sequence difference is selected from among insertions, deletions and changes.

75. (New) A method as recited in claim 9, wherein said method for detecting whether at least one molecule of said target nucleic acid is present in said first sample portion is part of a procedure selected from among the group consisting of fertility procedures, immunology procedures, cytology procedures, gas analysis procedures and pharmaceutical screening procedures.

76. (New) A method as recited in claim 9, wherein said loading of said first sample portion is carried out using at least centrifugal force.

77. (New) A method as recited in claim 9, wherein said first sample portion is loaded into said first sample chamber through at least one ink jet.

78. (New) A method as recited in claim 9, wherein said loading of said first sample portion is carried out using at least pressure.

79. (New) A method as recited in claim 9, wherein said loading of said first sample portion is carried out using at least a vacuum.

80. (New) A method as recited in claim 9, wherein said loading of said first sample portion is carried out using at least capillary action.

81. (New) A method as recited in claim 9, wherein said loading of said first sample portion comprises applying a vacuum.

82. (New) A method as recited in claim 9, wherein said loading of said first sample portion comprises applying suction.

83. (New) A method as recited in claim 9, wherein said loading of said first sample portion comprises creating magnetic attraction.

84. (New) A method as recited in claim 9, wherein said loading of said first sample portion comprises creating an electrophoretic force.

85. (New) A method as recited in claim 9, wherein said loading of said first sample portion comprises creating a coulombic force.

86. (New) A microfluidic device comprising:

a first sample chamber; and

a first sample portion, said first sample portion being positioned in said first sample chamber, whereby if said first sample portion contains at least a single molecule of a target nucleic acid, said first sample portion would attain a detectable concentration of said target

nucleic acid within a portion of said first sample chamber after a single round of amplification.

87. (New) A microfluidic device as recited in claim 86, wherein if said first sample portion contains at least a single molecule of said target nucleic acid, said first sample portion would attain a detectable concentration of said target nucleic acid within a portion of said first sample chamber after a single amplification step.

88. (New) A microfluidic device as recited in claim 86, wherein said first sample chamber further comprises constituents for enabling amplification of a target nucleic acid.

89. (New) A microfluidic device as recited in claim 86, wherein said single round of amplification comprises at least one thermocycle step.

90. (New) A microfluidic device as recited in claim 86, wherein said single round of amplification comprises at least one homogeneous amplification step.

91. (New) A microfluidic device as recited in claim 86, wherein said microfluidic device further comprises at least one cured displacing fluid which seals said first sample portion within said first sample chamber.

92. (New) A microfluidic device as recited in claim 86, wherein said microfluidic device further comprises at least one cured adhesive which seals said first sample portion within said first sample chamber.

93. (New) A microfluidic device as recited in claim 86, wherein said microfluidic device further comprises a sealing device adjacent to said first sample chamber.

94. (New) A microfluidic device as recited in claim 86, wherein said first sample chamber comprises a first microcapillary device.

95. (New) A microfluidic device as recited in claim 86, wherein said microfluidic device comprises a plurality of sample chambers.

96. (New) A microfluidic device comprising:

a first sample chamber; and

at least one amplification targeting reagent positioned in said first sample chamber,

whereby if a sample portion which comprises at least a single molecule of a target nucleic acid is positioned in said first sample chamber, said first sample portion would attain a detectable concentration of said target nucleic acid within a portion of said first sample chamber after a single round of amplification.

97. (New) A microfluidic device as recited in claim 96, wherein if said first sample portion contains at least a single molecule of said target nucleic acid, said first sample portion would attain a detectable concentration of said target nucleic acid within a portion of said first sample chamber after a single amplification step.

98. (New) A microfluidic device as recited in claim 96, wherein said first sample chamber further comprises constituents for enabling amplification of a target nucleic acid.

99. (New) A microfluidic device as recited in claim 96, wherein said single round of amplification comprises at least one thermocycle step.

100. (New) A microfluidic device as recited in claim 96, wherein said single round of amplification comprises at least one homogeneous amplification step.

101. (New) A microfluidic device as recited in claim 96, wherein said microfluidic device comprises a plurality of sample chambers.

102. (New) A microfluidic device as recited in claim 96, wherein said first sample chamber comprises a first microcapillary device.

103. (New) A method for detecting whether at least one molecule of a target nucleic acid is present in a sample portion, said method comprising:

loading a first sample portion into a first porous sample structure, said first sample portion comprising at least part of a sample, whereby if said first sample portion contains at least a single molecule of said target nucleic acid, said first sample portion would attain a detectable concentration of said target nucleic acid within a portion of said first porous sample structure after a single round of amplification;

subjecting said first sample portion in said first porous sample structure to at least a first amplification step; and then

determining whether said first sample portion contains at least one molecule of said target nucleic acid.

104. (New) A microfluidic device comprising:

a first porous sample structure; and

a first sample portion, said first sample portion being positioned in said first porous sample structure, whereby if said first sample portion contains at least a single molecule of a target nucleic acid, said first sample portion would attain a detectable concentration of said target nucleic acid within a portion of said first porous sample structure after a single round of amplification.

105. (New) A microfluidic device comprising:

a first porous sample structure; and

at least one amplification targeting reagent positioned in said first porous sample structure,

whereby if a sample portion which comprises at least a single molecule of a target nucleic acid is positioned in said first porous sample structure, said sample portion would attain a detectable concentration of said target nucleic acid within a portion of said first porous sample structure after a single round of amplification.

106. (New) A microfluidic assembly, comprising:

at least a first region having a first affinity to a first fluid sample; and

at least a second region having a second affinity to said first fluid sample,

said first affinity being greater than said second affinity,

at least a first reagent being positioned within at least said first region, said first reagent enabling amplification of a first target nucleic acid.

107. (New) A microfluidic assembly as recited in claim 106, wherein said microfluidic assembly further comprises at least a third region, said third region having a third affinity to said first fluid sample, said third affinity being greater than said second affinity, and

at least a second reagent being positioned within said third region, said second reagent enabling amplification of a second target nucleic acid.

108. (New) A method for detecting whether at least one molecule of a target nucleic acid is present in a first sample portion, said method comprising:

loading a first sample portion into a first sample chamber, said first sample portion comprising at least part of a sample, whereby if said first sample portion contains at least a single molecule of said target nucleic acid, said first sample portion would attain a detectable concentration of said target nucleic acid within a portion of said first sample chamber after a single round of amplification, said first sample chamber comprising means for minimizing diffusion of said first sample portion;

subjecting said first sample portion in said first sample chamber to at least a first amplification step; and then

determining whether said first sample portion contains at least one molecule of said target nucleic acid.

109. (New) A microfluidic device comprising:

a first sample chamber; and

a first sample portion, said first sample portion being positioned in said first sample chamber, said first sample chamber comprising means for minimizing diffusion of said first

sample portion, whereby if said first sample portion contains at least a single molecule of a target nucleic acid, said first sample portion would attain a detectable concentration of said target nucleic acid within a portion of said first sample chamber after a single round of amplification.

110. (New) A method for quantifying a number of molecules of at least a first target nucleic acid contained in a first sample, said method comprising:

loading a plurality of first sample portions into respective sample chambers, each of said first sample portions comprising part of a first sample, whereby any of said first sample portions which contains at least a single molecule of said first target nucleic acid would attain a detectable concentration of said first target nucleic acid after a single round of amplification;

subjecting each said first sample portion in said respective sample chambers to at least a first amplification step;

for each said first sample portion, determining whether said first sample portion contains at least one molecule of said first target nucleic acid; and then

quantifying a number of said first sample portions which contain at least one molecule of said first target nucleic acid.

111. (New) A method for quantifying a number of molecules of at least a first target nucleic acid contained in a first sample, said method comprising:

loading at least a first sample portion into a first sample chamber, said first sample portion comprising at least a part of a first sample, whereby if said first sample portion contains at least a single molecule of a first target nucleic acid, said first sample portion

would attain a detectable concentration of said first target nucleic acid within a portion of said first sample portion after a single round of amplification;

subjecting said first sample portion to at least a first amplification step;

determining whether said first sample portion contains at least one molecule of said first target nucleic acid; and then

quantifying a number of peaks indicative of said detectable concentration.

112. (New) A method for quantifying a number of molecules of at least a first target nucleic acid contained in a first sample, said method comprising:

loading at least a first sample portion into a first sample chamber, said first sample portion comprising at least a part of said first sample, whereby if said first sample portion contains at least a single molecule of said first target nucleic acid, said first sample portion would attain a detectable concentration of said first target nucleic acid within a portion of said first sample portion after a single round of amplification;

subjecting said first sample portion in said first sample chamber to at least a first amplification step; and then

detecting an intensity of at least one peak indicative of said detectable concentration.

113. (New) A method for detecting, for each of a plurality of sample portions, whether the sample portion includes at least one molecule of a target nucleic acid, said method comprising:

for each individual sample of a plurality of samples, loading at least one sample portion of said individual sample into at least one respective sample chamber of a plurality of

sample chambers, each said sample portion comprising at least a part of said individual sample,

whereby for each individual sample portion, if said sample portion contains at least a single molecule of said target nucleic acid, said sample portion would attain a detectable concentration of said target nucleic acid within a portion of said sample portion after a single round of amplification;

subjecting said sample portions to at least a first amplification step; and then

for each of a plurality of said sample portions, determining whether said sample portion contains at least one molecule of said target nucleic acid.

114. (New) A microfluidic device comprising:

a first element comprising a first surface;

a second element, said second element comprising a second surface, said second surface facing said first surface and being spaced from said first surface;

said first element comprising at least a first sample retaining element,

at least a portion of said first surface of said first element having a first affinity to a first fluid, and

said first sample retaining element having a second affinity to said first fluid, said second affinity differing from said first affinity at least in part as a result of at least one of said first surface and said first sample retaining element being subjected to at least one treatment selected from the group consisting of plasma treatments, ion embedding treatments, surface charging treatments, chemical treatments, optical treatments, electronic treatments and electromagnetic treatments.

115. (New) A method comprising:

supplying a fluid sample to a flow-through channel defined between a first surface of a first element and a second surface of a second element, said second surface facing said first surface and being spaced from said first surface,

said first element comprising at least a first sample retaining element,

at least a portion of said first surface of said first element having a first affinity to a first fluid, and

said first sample retaining element having a second affinity to said first fluid, said second affinity differing from said first affinity at least in part as a result of at least one of said first sample retaining element and said first surface being subjected to at least one treatment selected from the group consisting of plasma treatments, ion embedding treatments, surface charging treatments, chemical treatments, optical treatments, electronic treatments and electromagnetic treatments.

116. (New) A method of making a microfluidic device, said method comprising:

causing at least a first sample retaining element in a first element to at least temporarily have a second affinity to a first fluid, said second affinity differing from a first affinity of a first surface of said first element to said first fluid,

said first surface being spaced from a second surface of a second element, said second surface facing said first surface.

117. (New) A microfluidic device comprising:

at least one microcapillary device, said microcapillary device comprising at least a first sample retaining element, said first sample retaining element having at least a first

surface which exhibits at least one characteristic selected from the group consisting of hydrophobicity, hydrophilicity, electromagnetic force exertion and electrostatic force exertion.

118. (New) A microfluidic device comprising:

a first element comprising a first surface;

a second element, said second element comprising a second surface, said second surface facing said first surface and being spaced from said first surface;

said first element comprising at least one hydrophilic pattern comprising at least a first sample retaining element,

said first surface of said first element having a first affinity to a first fluid, and

said first sample retaining element having a second affinity to said first fluid, said second affinity differing from said first affinity.

119. (New) A method comprising:

supplying a fluid sample to a flow-through channel defined between a first surface of a first element and a second surface of a second element, said second surface facing said first surface and being spaced from said first surface; and

inducing in said first element at least one hydrophilic pattern by electrets or by internal or external electrodes to provide a charged surface, whereby said pattern in said first element has an affinity to a first fluid which differs from an affinity to said first fluid of portions of said first element outside of said hydrophilic pattern.

120. (New) A method comprising:

loading a sample into a microfluidic device, said microfluidic device comprising plural sample chambers, said sample comprising at least a portion of a first fluid;

subdividing the sample into a plurality of sample portions, such that respective sample portions are positioned in each of a plurality of said sample chambers, each of said plurality of sample chambers having a respective volume such that if a sample portion positioned in said sample chamber comprises at least one molecule of a first target nucleic acid, said first target nucleic acid would attain a detectable concentration in said sample chamber after a single round of amplification; and

subjecting the sample portions loaded into said respective sample chambers to at least a first amplification step.

121. (New) A method for detecting whether at least one molecule of a first target nucleic acid is present in a sample and detecting whether at least one molecule of a second target nucleic acid is present in said sample, said method comprising:

loading a first portion of said sample into at least a first sample chamber, whereby if said first portion contains at least a single molecule of said first target nucleic acid, said first portion would attain a detectable concentration of said first target nucleic acid within a portion of said first sample chamber after a single round of amplification;

loading a second portion of said sample into at least a second sample chamber, whereby if said second portion contains at least a single molecule of said second target nucleic acid, said second portion would attain a detectable concentration of said second target nucleic acid within a portion of said second sample chamber after a single round of amplification;

subjecting said first portion in said first sample chamber to at least a first amplification step;

subjecting said second portion in said second sample chamber to at least a first amplification step; and then

determining whether said first portion contains at least one molecule of said first target nucleic acid and determining whether said second sample portion contains at least one molecule of said second target nucleic acid.

122. (New) A method for detecting whether at least one molecule of a first target nucleic acid is present in a first sample and detecting whether at least one molecule of a second target nucleic acid is present in a second sample, said method comprising:

loading at least a portion of a first sample into at least a first sample chamber, whereby if said portion of said first sample contains at least a single molecule of said first target nucleic acid, said portion of said first sample would attain a detectable concentration of said first target nucleic acid within part of said first sample chamber after a single round of amplification;

loading at least a portion of a second sample into at least a second sample chamber, whereby if said portion of said second sample contains at least a single molecule of said second target nucleic acid, said portion of said second sample would attain a detectable concentration of said second target nucleic acid within part of said second sample chamber after a single round of amplification;

subjecting said portion of said first sample in said first sample chamber to at least a first amplification step;

subjecting said portion of said second sample in said second sample chamber to at least a first amplification step; and then

determining whether said portion of said first sample contains at least one molecule of said first target nucleic acid and determining whether said portion of said second sample contains at least one molecule of said second target nucleic acid.

123. (New) A microfluidic device comprising:

at least a first sample chamber, said first sample chamber comprising at least a first ingredient which will react with a first target nucleic acid if contacted with said first target nucleic acid and subjected to at least a first round of amplification; and

at least a second sample chamber, said second sample chamber comprising at least a second ingredient which will react with a second target nucleic acid if contacted with said second target nucleic acid and subjected to at least a first round of amplification,

such that:

if a first sample portion contains at least one molecule of said first target nucleic acid and is loaded into said first sample chamber, a reaction product of amplification of said first sample portion will attain a detectable concentration of said first target nucleic acid within at least a portion of said first sample chamber after a single round of amplification, and

if a second sample portion contains at least one molecule of said second target nucleic acid and is loaded into said second sample chamber, a reaction product of amplification of said second sample portion will attain a detectable

concentration of said target nucleic acid within at least a portion of said second sample chamber after a single round of amplification.

124. (New) A method for detecting whether at least one molecule of a first target nucleic acid is present in a first sample portion, said method comprising:

loading a first sample portion into a first sample chamber, said first sample chamber comprising at least a portion of an inside of a first microcapillary device, said first sample portion comprising at least part of a sample, whereby if said first sample portion contains at least a single molecule of said target nucleic acid, said first sample portion would attain a detectable concentration of said target nucleic acid within a portion of said first sample portion after a single round of amplification;

subjecting said first sample portion in said first sample chamber to at least a first amplification step; and then

determining whether said first sample portion contains at least one molecule of said target nucleic acid.

125. (New) A microfluidic device comprising:

a first sample chamber; and

a first sample portion, said first sample chamber comprising at least a portion of an inside of a first microcapillary device, said first sample portion being positioned in said first sample chamber, whereby if said first sample portion contains at least a single molecule of a target nucleic acid, said first sample portion would attain a detectable concentration of said target nucleic acid within a portion of said first sample chamber after a single round of amplification.

126. (New) A microfluidic device comprising:

a first sample chamber; and

at least one amplification targeting reagent positioned in said first sample chamber, said first sample chamber comprising at least a portion of an inside of a first microcapillary device,

whereby if a sample portion which contains at least a single molecule of said target nucleic acid is loaded in said first sample chamber, said first sample portion would attain a detectable concentration of said target nucleic acid within a portion of said first sample chamber after a single round of amplification.

127. (New) A microfluidic assembly, comprising:

at least a first microcapillary device, said microcapillary device defining at least a first sample chamber;

at least one reagent which enables amplification of a target nucleic acid, said at least one reagent being positioned within said sample chamber.

128. (New) A method for detecting whether at least one molecule of a target nucleic acid is present in a first sample portion, said method comprising:

depositing at least a first sample portion in a sample retaining means, said first sample portion comprising at least a portion of a first sample;

forcing a curable fluid across an exposed surface of said sample retaining means, thereby displacing any excess first sample from said exposed surface without displacing said sample from said sample retaining means.

129. (New) A method for detecting whether at least one molecule of a target nucleic acid is present in a first sample portion, said method comprising:

subjecting said first sample portion to a single amplification step, thereby amplifying a single molecule in said first sample portion to a detectable level; and then

determining whether said first sample portion contains at least one molecule of said target nucleic acid.

130. (New) A method for detecting a single molecule of a target nucleic acid in a first sample portion, said method comprising:

amplifying said single molecule to a detectable level in a single amplification step.

131. (New) A method comprising:

amplifying at least one target nucleic acid molecule to a detectable level in a single amplification step.